STIR/SHAKEN for TDM

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Abstract: *The STIR/SHAKEN framework supports call authentication for SIP/IP traffic but does not cover calls where any part of the path traverses non-IP (TDM) infrastructure. ATIS has proposed two potential alternatives for non-IP call authentication. Both approaches have advantages and disadvantages, and there is disagreement among ATIS member companies on a consensus approach. Furthermore, single-vendor solutions are highly unlikely to provide an end-to-end solution. The FCC has issued a Notice of Inquiry that is expected to be followed by a mandated choice and timeline for implementation. This is a positive development as Ribbon believes that the industry will not settle on a common solution that works across all service provider pairs absent an FCC mandate. Ribbon is committed to ensuring our customers can meet their regulatory requirements and will implement necessary STI-AS/VS functionality to integrate into the eventual mandated industry solution for STIR/SHAKEN for TDM.*

The STIR/SHAKEN framework defines a call authentication approach for SIP/IP traffic but does not consider non-IP (TDM) traffic. This includes not just the originating and terminating legs of a call but the entire call path. In short, the STIR/SHAKEN framework is ineffective if any leg of the call path is TDM. This limitation is well recognized and ATIS Technical Report ATIS-1000097 compares two potential alternatives for calling party attestation for various combinations of non-SIP/IP portions within the call path:

- **ATIS-1000095, Extending STIR/SHAKEN over TDM**
  https://access.atis.org/apps/group_public/download.php/67542/ATIS-1000095.v002.pdf

- **ATIS-1000096, Out-of-Band PASSporT Transmission Involving TDM Networks**
  https://access.atis.org/apps/group_public/download.php/60535/ATIS-1000096.pdf

- **ATIS-1000097, Alternatives for Call Authentication for Non-IP Traffic**
  https://access.atis.org/apps/group_public/download.php/67654/ATIS-1000097.v002.pdf

ATIS-1000095 takes advantage of existing ISUP signaling parameters to minimize the impact on existing TDM switches. At a high level, for every TDM leg in the call path, the desired attestation level is passed in ISUP signaling. The base method uses the ISUP screening Indicator (ISUP SI). Through bilateral agreements, entities on either side of the TDM connection agree on the mapping between screening values and attestation level. With just the ISUP SI, ATIS-1000095 can effectively signal the Telephone Number (TN) authentication. This is most useful when calls originate or terminate directly to ISUP. TDM connected carriers can use this to communicate TN authentication to the Local Tandem or LD switch which may then sign the call as it enters the SIP backbones. The originating end office switch does not need software modifications or additional equipment to support line side screening and signaling of that screening information through ISUP SI.

An alternative method proposed in ATIS-1000095 requires a carrier doing SIP to TDM conversion to encode the SHAKEN PASSporT in the ISUP UUI parameter. Any carrier doing a subsequent TDM to SIP conversion can then recreate the necessary SHAKEN PASSporT using the decoded value of the PASSporT passed in the ISUP UUI. This alternative, when possible, is capable of passing authentication information beyond the attestation level.

ATIS-1000096 maximizes alignment with STIR/SHAKEN by using identical PASSporT format and types but passing these out-of-band to the TDM signaling. This method requires deployment of STI Call Placement Services (STI-CPS) that are all mesh interconnected. Any TDM originating carrier, or any carrier potentially performing a SIP to TDM conversion, must upload a copy of the PASSporT to a STI-CPS. That STI-CPS then shares the PASSporT with all other STI-CPS. Any TDM terminating carrier, or any carrier performing a TDM to SIP conversion, must then retrieve the appropriate PASSporT from a STI-CPS. The match is obtained by the calling number, called number, and approximate time of call.

Each method presented above has advantages and disadvantages as explained in ATIS-1000097. For ATIS-1000095 using the ISUP UUI variant, this parameter is specifically defined for user use and, hence, may not be available. In this situation, that TDM trunk will need to fall back to using the ISUP screening parameter for passing just the attestation value. For ATIS-1000096, the solution requires non-trivial functional enhancements to TDM equipment and/or the implementation of a STI InterWorking function. This is complicated by the fact that much TDM equipment is mature with infrequent release cycles. The reader is referred to ATIS-1000097 for a more detailed comparison of the choices.

As of this date, there isn't consensus on a single approach and for each TDM leg in a call path, the entities on both sides need to use a common approach. In October 2022, the FCC launched a Notice of Inquiry regarding STIR/SHAKEN for TDM and requested comments on several topics including comments on the two standards for call authentication in non-IP networks. The notice indicated that the comments reply date was January 11, 2023.

Currently, there is no active or proposed FCC mandate for call attestation in TDM networks. See note [1] below. Given the disagreement among the member companies of ATIS regarding these two methods, Ribbon believes that the industry will not settle on a common solution that works across all service provider pairs absent an FCC mandate.

Ribbon is an active participant in the STIR/SHAKEN ecosystem and is committed to ensuring our customers can meet their regulatory requirements. While some vendors have suggested point solutions for the problem, these are not universally usable across combinations of service providers, and the benefit of call authentication requires end-to-end success. While Ribbon prefers the approach advocated by ATIS-1000095, we plan on implementing STI-AS/VS functionality to integrate into whatever is mandated as the industry solution for STIR/SHAKEN for TDM.

Please contact your account team for any further information on Ribbons plans and roadmaps.

[1] FCC-CIRC2210-03 § II (B)(9) It (the TRACED Act) also directed the Commission to grant an extension for voice service providers that "materially rely on a non-[IP] network . . . until a call[er ID] authentication protocol has been developed for calls delivered over non-[IP] networks and is reasonably available.